



2006 Amendment
August 2006

Upper East Coast Water Supply Plan **PLANNING DOCUMENT**

Water Supply Department
South Florida Water Management District

Acknowledgements

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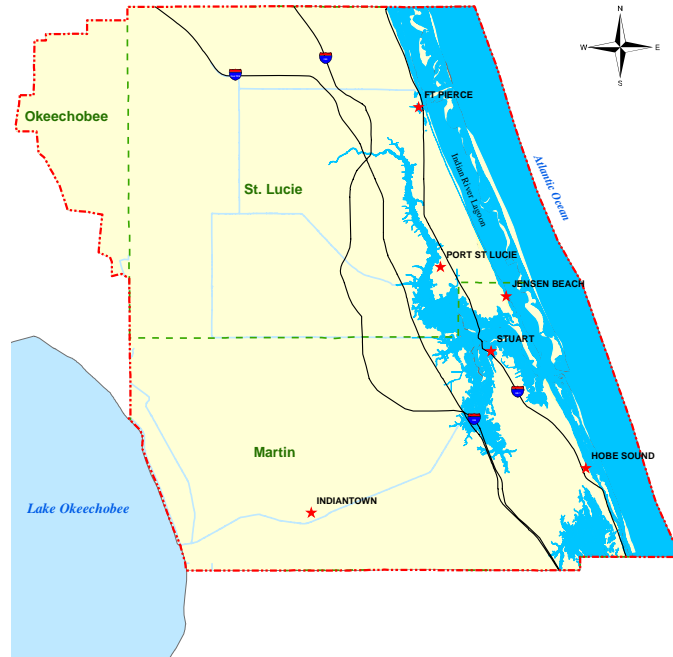
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Executive Summary

The Upper East Coast (UEC) Planning Area consists of St. Lucie and Martin counties and eastern Okeechobee County. Its boundaries encompass over 1,230 square miles and generally reflect the watersheds of the C-23, C-24, C-25 and C-44 canals. The Loxahatchee River and its watershed are partially located within Martin County.

An update to the original 1998 *Upper East Coast Water Supply Plan* (1998 UEC Plan) was completed in 2004, the 2004 *Upper East Coast Water Supply Plan Update* (2004 UEC Plan Update). The primary reason for this 2006 *Upper East Coast Water Supply Plan Amendment* (2006 UEC Plan Amendment) is to provide important information to local governments concerning revisions to state law requirements relevant to water supply planning and the potable water provisions contained within each local government's comprehensive plan. Within 18 months following the approval of this plan amendment, local governments within the UEC Planning Area are required to revise their comprehensive plans and adopt revisions to their 10-Year Water Supply Facilities Work Plans to include specific water supply projects that will meet the 10-year projected needs.



The South Florida Water Management District's (SFWMD or District) strategic goal for all of its water supply planning efforts is to ensure an adequate supply of water to protect natural systems and to meet all existing and projected reasonable-beneficial uses, while sustaining water resources for future generations.

The UEC Planning Area's projected population growth over the next 20 years will significantly impact the region's public water demands, particularly in the urban sector. The UEC Region's total population is expected to increase from 320,664 in 2000 to about 584,927 residents by 2025. This estimate is 20 percent higher than the population estimate projected in the 2004 UEC Plan Update. Development of alternative water supplies will play a vitally important role in meeting water needs, as further development of traditional supplies becomes increasingly limited.

While public water supply needs are projected to increase by 65 million gallons per day (MGD) with the region's projected rapid growth, and agricultural water demand is forecasted to decrease 7 percent, agriculture will remain the Upper East Coast Planning Area's largest water user. The largest percentage of change in urban water demand over the next 20 years will be in the thermoelectric power generation self-supply sector as three new power generation facilities are projected to be located in this region.

As a result of this water supply planning process, new public water supply capacity is expected to exceed Year 2025 demands. The utilities have identified sufficient projects to meet the projected water needs for the Year 2025, and projects specific to each major public water supplier are included in this plan amendment. Forty-seven alternative water supply projects and one traditional water supply project were submitted by local utilities for this UEC Plan Amendment.

The 2005 Water Protection and Sustainability Program established a recurring state funding source to support alternative water supply development. State funds are matched with District funds and administered through the District's Alternative Water Supply Funding Program to cost-share alternative water supply projects that are ready for construction. Local governments with alternative water supply projects included in this plan amendment may be eligible to receive up to 40 percent of construction costs for project work completed within the October 1 through August 1 funding period. During the implementation phase of this amendment, the District will continue to work closely with local water suppliers.

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Acronyms and Abbreviations

CERP	Comprehensive Everglades Restoration Plan
CUP	consumptive use permitting
District	South Florida Water Management District
EAR	Evaluation and Appraisal Report
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FDACS	Florida Department of Agriculture and Consumer Services
FDCA	Florida Department of Community Affairs
FPL	Florida Power & Light
F.S.	Florida Statutes
MGD or mgd	million gallons per day
MIL	mobile irrigation laboratory
NAFTA	North American Free Trade Agreement
NRCS	Natural Resources Conservation Service
PWS	public water supply
RO	reverse osmosis
SAS	Surficial Aquifer System
SFWMD	South Florida Water Management District
UEC	Upper East Coast
UEC Plan	Upper East Coast Water Supply Plan
U.S.	United States
USDA-NRCS	United States Department of Agriculture - Natural Resources Conservation Service
WRAC	Water Resources Advisory Commission

SECTION 1

Introduction

The Upper East Coast (UEC) Planning Area is one of the four planning areas in the South Florida Water Management District (SFWMD or District) for which water supply plans are prepared. Regional water supply plans encompass a 20-year future planning horizon and generally are updated every five years. Although the *1998 Upper East Coast Water Supply Plan* (1998 UEC Plan) was updated in 2004, adoption of important growth-management legislation and escalating population growth in the region necessitated an amendment to the *2004 Upper East Coast Water Supply Plan Update* (2004 UEC Plan Update). This *2006 Upper East Coast Water Supply Plan Amendment* (2006 UEC Plan Amendment) accomplishes the following objectives:

- Brings the UEC Water Supply Plan into compliance with new state law requirements.
- Provides local governments with the information they need to comply with the new legislative requirements.
- Qualifies alternative water supply projects as eligible for funding assistance.

The 2004 UEC Plan Update provided water demand estimates and projections; an evaluation of existing regional water resources; identification of water supply-related issues; a discussion of water source options; descriptions of water resource and water supply projects; and, recommendations for meeting projected demands for the region.

IMPACTS OF 2005 LEGISLATION

The legal authority and requirements for water supply planning are included in Chapters 373, 403 and 187 of the Florida Statutes. During the State of Florida's 2005 legislative session, lawmakers revised state water law and created the Water Protection and Sustainability Program. The alternative water supply portion of this program is intended to reduce competition between users and natural systems for available water by encouraging the development of alternative water supplies.



Strengthening the Link between Regional
Water Supply Planning and Local
Government Comprehensive Planning

The new statutory provision strengthens the link between regional water supply plans and the potable water provisions contained within each local government's comprehensive plan. All local governments within the UEC Planning Area are required to prepare 10-Year Water Supply Facilities Work Plans that identify water supply projects, and adopt revisions to comprehensive plans within 18 months following the approval of this water supply plan amendment. This new portion of the law is designed to ensure that adequate potable water facilities are constructed and concurrently available with new development.

The Water Protection and Sustainability Program provides annual state revenues matched with District funds to support alternative water supply development. This combination of state and District funds is available each year through the District's Alternative Water Supply Funding Program for projects that are ready to be constructed. Eligible projects can receive up to 40 percent of the construction costs for work that can be completed within the funding period (October 1 through August 1). Funding proposals are solicited in the spring of each year.

To be eligible for cost-share funding, the specific alternative water supply projects must be identified in the appropriate water supply plan. While inclusion in this 2006 UEC Plan Amendment enables projects planned for the UEC Region to be eligible to apply for funding assistance from the District's Alternative Water Supply Funding Program, a project's inclusion in this plan amendment does not serve as an application for funding, nor does it guarantee funding. To apply for alternative water supply funding or for more information, see the SFWMD's Web site at <http://www.sfwmd.gov/org/wsd/aws>.

In addition to a general requirement to coordinate land use planning with regional water supply planning, some of the specific water supply-related requirements under the new law that now must be addressed in local government comprehensive plans include:

General Requirement: Identify water supply sources necessary to meet existing and projected water use demands for the established planning period of the comprehensive plan. (Section 163.3167(13), Florida Statutes (F.S.))

Future Land Use Element: Future land uses are to be based on the availability of water supplies, population projections and associated public facilities. (Subsection 163.3177(6)(a), F.S.)

Potable Water Element: This element must identify alternative and traditional water supply projects, conservation and reuse necessary to meet the water needs identified in the regional water supply plan for the local government's jurisdiction. Within 18 months following an approved update of the regional water supply plan, comprehensive plans must: a) incorporate water supply projects from those identified in the regional water supply plan or propose alternatives; and, b) include a minimum 10-year work plan for building all public, private and regional water

supply facilities needed to serve existing and new development. (Subsection 163.3177(6)(c), F.S.)

Evaluation and Appraisal Report (EAR): Include an analysis of the implementation of the 10-year work plan for building all water supply facilities within the local government's jurisdiction. (Subsection 163.3191(2)(l), F.S.)

This 2006 UEC Plan Amendment presents new information that impacts water supply planning for the UEC Planning Area, primarily future population projections, water demands and alternative water supply projects in accordance with the new legislation.

One of the key aspects of the legislation passed in 2005 is a requirement for the regional water supply plan to identify specific water supply projects that can be used by a particular public water supply or self-supply user to meet its projected 20-year water supply development needs. These identified project options are to be used both in local government comprehensive planning for water supply, and to comply with the new funding eligibility requirements for the District's



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Alternative Water Supply Funding Program. One of the SFWMD's main objectives for this plan amendment is to assist local governments and water users with the new funding requirements for alternative water supply projects in order to enable each project to be eligible for funding assistance. **Table 1** summarizes the 48 projects submitted by local water users to increase available water supplies for the years 2007–2025 for the UEC Planning Area:

Table 1. UEC Water Supply Development Projects 2007–2025.

County	Brackish Groundwater	Reclaimed Water	Traditional	Total
Martin Co.	5	23	1	29
Okeechobee Co.	0	0	0	0
St. Lucie Co.	9	10	0	19
Total	14	33	1	48

In the UEC Planning Area, 15 of 16 utilities indicated adequate supplies to meet future demand in Year 2025 with the combination of projects they submitted and existing supplies. More than half of the utilities in the UEC Planning Area have a significant amount of alternative water supplies. One utility in the planning area identified an unmet

need in future water supply and did not submit projects appropriate for consideration in the plan amendment. In the case of an unmet need, the District will recommend a project or projects for local utilities to include in the plan amendment.

REVISED PROJECTIONS TO REFLECT GROWTH IN REGION

Since publication of the 2004 UEC Plan Update, the District has increased its water demand projection for the UEC Planning Area for Year 2025 to 378 million gallons per day (MGD). This is 12 percent higher than the 337 MGD figure reported in the 2004 UEC Plan Update.

Dynamic population growth throughout the region, primarily in St. Lucie County, is the major factor impacting the higher water demand. New 2006 population statistics from the University of Florida, Bureau of Economics and Business Research (BEBR), indicate the UEC Region's population will grow to 584,927 by 2025. This population projection is 20 percent higher than the 2002 BEBR estimate for 2025 (referenced in the 2004 UEC Plan Update).

In addition, there are a number of proposed comprehensive plan amendments for large developments in St. Lucie County and one potentially large development in Okeechobee County that represent significantly greater 2025 population growth than the latest 2006 BEBR projections. Such mounting development pressures would likely require a much more significant water supply initiative in this area than the demand projections in this plan amendment would indicate. The potential for rapid development of new areas in this region is such that the 2004 UEC Plan Update may require future amendments, and/or updates as additional information becomes available. The District will continue to work closely with local governments and monitor growth decisions in these areas.



Urban Development in St. Lucie County

To help address some of the water supply needs for this rapid growth, the SFWMD is funding a water resource development project in the UEC Planning Area. This project supports the efforts of the St. Lucie County Utility Regionalization Task Force, which is conducting a subregional feasibility study for consideration of water supply integration. The Task Force consists of representatives from St. Lucie County, the City of Fort Pierce and the Fort Pierce Utilities Authority. This Task Force is identifying opportunities to approach the water and wastewater needs of northern St. Lucie County from a regional perspective.

Additionally, water demand projections for Thermoelectric Power Generation Self-Supply have also increased significantly since 2004. To meet the region's growing energy needs, three new power generation facilities are planned, which will increase the water requirement projections for this use category for the Year 2025 to 47.6 MGD. This revised estimate is 59 percent greater than the figure projected in 2004.

CONTENTS OF THIS AMENDMENT

This amendment to the 2004 UEC Plan Update brings the Upper East Coast Water Supply Plan into compliance with the new state legislation requirements, incorporating the State of Florida's 2005 statutory changes to include the following information:

Section 1 - Introduction: Identifies the changes in state law that resulted in the need for the amendment; summarizes the key differences in population and demand projections from the 2004 UEC Plan Update; and, provides information about the specific sections of the update being amended.

Section 2 - Updated Demand Estimates and Projections: Provides updated 2025 projections for Public Water Supply and Thermoelectric Power Generation Self-Supply water use categories. Only a brief summary of the 2004 UEC Plan Update projections for these categories are provided in this document. Additional details about previous water use estimates and projected demands are provided in the 2004 UEC Plan Update Appendix A.

Section 3 - Water Supply Development Projects: Summarizes water supply projects anticipated to meet the needs of the UEC Planning Area for the next 20 years at the level of certainty for a 1-in-10 year drought event.

The 2006 UEC Plan Amendment consists of two new sections, one amended section, one amended appendix and two new appendices. **Table 2** shows a comparison of the 2004 UEC Plan Update with this plan amendment.

The accompanying CD contains electronic versions of this amendment package, the 2004 UEC Plan Update and Appendices, and an updated *Consolidated Water Supply Plan Support Document*. This material is also available from the District's Water Supply Plan Web site at: <http://www.sfwmd.gov/org/wsd/wsp>.

Table 2. Comparison of 2004 UEC Plan Update with 2006 UEC Plan Amendment.

2004 UEC Plan Update		2006 UEC Plan Amendment New Sections
Chapter	Status	
	New	1. Introduction
1	Same	
2	Amended	2. Updated Demand Estimates and Projections (updated 2025 estimates for Public Water Supply and Thermoelectric Power Generation Self-Supply Uses)
3	Same	
4	Same	
5	Same	
6	Same	
	New	3. Water Supply Development Projects
Appendix	Status	Amended, Updated and New Appendices
A	Amended	A. Demand Assessments and Projections (updated 2025 estimates for Public Water Supply and Thermoelectric Power Generation Self-Supply Uses)
B	Same	
C	Same	
D	Same	
E	Same	
	New	F. Water Supply Development Projects
	New	G. Information for Local Government Comprehensive Plans

Amendment Process

As a new requirement of state law, specific Water Supply Development projects are included in this plan amendment to address projected needs for the next 20 years. The District recognizes there are public water supply utilities conducting detailed studies to estimate population and demand increases, and identify the most appropriate water supply project options to meet those future needs. In addition, other large water users, especially thermoelectric utilities and agricultural users, will require time to identify the specific water supply projects they intend to develop once the locations of their water supply needs have been determined. For these reasons, the District will consider amending its regional water supply plans on an annual basis for the next three years to allow for the inclusion of additional, specific alternative water supply projects. Such amendments, if needed, are proposed in January and February of subsequent years until the next plan update. Only local governments affected by additional alternative water supply projects proposed in future amendments would be required to amend their comprehensive plans, consistent with the requirements of Subsection 163.3177(6)(c), F.S. It is anticipated that at the end of the three-year period, this annual plan amendment process will be re-evaluated.

SECTION 2

Updated Demand Estimates and Projections

This 2006 Upper East Coast Plan Amendment (UEC Plan Amendment) replaces specific sections of Chapter 2 in the *2004 Upper East Coast Water Supply Plan Update* (UEC Plan Update). Since the adoption of the UEC Plan Update, new information regarding population and water demands in the UEC Planning Area has become available and is included in this section. The new data indicate that population projections are significantly greater than projected in 2004. The current demand information for public water supply is higher than reported in 2004, and has been revised upward in this plan amendment because the specific water supply development projects identified in this plan amendment must adequately meet the expected demands of the UEC Planning Area.

This section replaces Chapter 2: Demand Estimates and Projections, pages 17-21, including “Urban Water Demand” in the 2004 UEC Plan Update. The remainder of Chapter 2, including agricultural water demand, is unaffected by these changes and not included in this section. In this section, **Figure 4** and **Table 2** through **Table 8** are presented in basically the same format as they appeared in Chapter 2 of the 2004 UEC Plan Update.

The updated projections in this plan amendment incorporate changes to the Public Water Supply and the Thermoelectric Power Generation Self-Supply water use categories. In the UEC Plan Update, demand estimates for 2000 and projections for 2025 were made for six water use categories. The Public Water Supply use category refers to all potable (drinking quality) water supplied by water treatment facilities reporting average pumpages greater than 100,000 gallons per day (GPD), or 0.1 million gallons per day (MGD), for all types of customers. The other five water use categories are self-supplied. Commercial and Industrial Self-Supply water uses are self-supplied business operations using 100,000 gallons per day (GPD) (0.1 MGD) or more. Recreational water use includes landscape and golf course irrigation demand. The Landscape subcategory includes water used for parks, cemeteries and other self-supplied irrigation applications with demands greater than 100,000 GPD (0.1 MGD). The golf course subcategory includes those operations using groundwater or surface water, but not operations using reclaimed water. The Domestic Self-Supply category includes only those households whose primary sources of water are private wells. Thermoelectric Power Generation water refers to replacement water for losses from cooling water at electrical plants, but does not include facilities using ocean water for cooling. Agricultural water is used for crop irrigation, livestock watering and aquaculture.

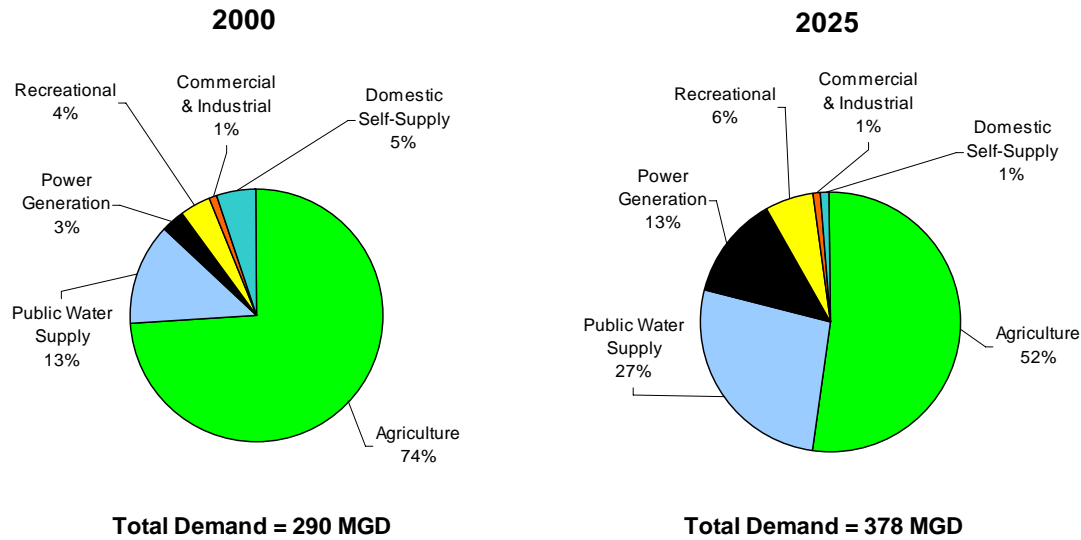


Figure 4. Overall Water Demands for 2000 and 2025 in the UEC Planning Area.

For 2000, the total assessed water demand for the UEC Planning Area was approximately 290 MGD, and this is projected to grow to 378 MGD by 2025 (**Figure 4**).

Conservation levels beyond current industry practices were not considered in the 2004 UEC Plan Update, but were dealt with as part of the water source option analysis in Chapter 5 of the 2004 UEC Plan Update.

From 2000 to 2025, total water demand is projected to increase by 30 percent, from 290 to 378 MGD, as shown in **Table 2**. Thermoelectric Power Generation shows the largest projected increase of 386 percent. Public Water Supply is expected to grow 179 percent, while Agricultural demand is projected to decline by 7 percent. Nevertheless, agricultural water demand is projected to remain the single largest category of use. In 2000, agriculture accounted for 74 percent of the total demand; however, a slight projected decline in agricultural demands combined with projected increases in urban uses results in projected agricultural use declining to 52 percent of the total demand by 2025. This does not include lands coming out of citrus production related to implementation of the Comprehensive Everglades Restoration Plan (CERP). Public water supply demands are projected to increase from 13 percent to 27 percent of the overall water demands.

The total projected water use demands in this 2006 plan amendment are 12 percent higher than the projected demands in the 2004 UEC Plan Update. This is due to a 31 percent higher projection for Public Water Supply and a 59 percent higher projection for Thermoelectric Power Generation demands in 2025 in this plan amendment (as compared to the 2004 UEC Plan Update).

Table 2. Overall Water Demands for 2000 and 2025 (MGD).

Category	Estimated Historical Demands 2000 (MGD)	Projected Average Year Demands 2025 (MGD)	Percent Change 2000–2025
Agriculture ^a	212.8	197.1	-7%
Public Water Supply	36.5	101.9	179%
Domestic Self-Supply	14.6	2.7	-82%
Commercial & Industrial Self-Supply	3.3	4.9	48%
Recreational Self-Supply	12.8	23.8	86%
Thermoelectric Power Generation Self-Supply	9.8	47.6	386%
Total	289.8	378.0	30%

a. Agricultural demand projections do not include approximately 23,000 acres of citrus land coming out of irrigated citrus production with implementation of the CERP.

URBAN WATER DEMAND

As reflected in the 2004 UEC Plan Update, urban water demand includes: 1) Public Water Supply provided by utilities; 2) Domestic Self-Supply; 3) Commercial and Industrial Self-Supply; 4) Recreational Self-Supply; and, 5) Thermoelectric Power Generation Self-Supply. Public Water Supply was the largest component of urban water demand in 2000 (47 percent), followed by Domestic Self-Supply (19 percent), Recreational Self-Supply (17 percent), Thermoelectric Power Generation Self-Supply (13 percent), and Commercial and Industrial Self-Supply (4 percent). Urban water demand in the UEC Planning Area in 2000 was estimated to be approximately 77 MGD, whereas in this 2006 plan amendment urban water demand is projected to increase to about 181 MGD by 2025.

The driving force behind urban demand is population. Population estimates for 2000 were taken from the U.S. Bureau of the Census. Population projections for the Year 2025 were obtained from the University of Florida, Bureau of Economic and Business Research (BEBR 2006), and are shown in **Table 3**. The total population of the planning area for 2000 was 320,664 and is projected to increase by 82 percent to 584,927 in 2025. The projected population for 2025 is 20 percent higher



Urban Development in the UEC Planning Area

in this plan amendment than projected in the 2004 UEC Plan Update.

Table 3. Population in the UEC Planning Area, 2000–2025.

County	2000			2025		
	Total	Public Water Supply	Domestic Self-Supply	Total	Public Water Supply	Domestic Self-Supply
St. Lucie County	192,695	130,585	62,110	389,000	381,612	7,388
Martin County	126,731	98,131	28,600	194,400	186,795	7,605
Okeechobee Area	1,238	0	1,238	1,527	0	1,527
Total Planning Area	320,664	228,716	91,948	584,927	568,407	16,520

Source: U.S. Bureau of the Census 2001; University of Florida Bureau of Economic and Business Research, 2006.

Public Water Supply and Domestic Self-Supply

The estimated water demand for Public Water Supply and Domestic Self-Supply users in the UEC Planning Area was 51 MGD in 2000. These water demands are projected to increase by 105 percent from 2000 to 2025 to a total water demand of 105 MGD

(**Table 4**). The Domestic Self-Supply category includes residents not living within areas served by utilities; residents living within areas served by utilities, but who are not connected to a utility; and, residents served by utilities with historical or projected demands of less than 100,000 GPD (0.1 MGD). About 29 percent of the 2000 population was self-supplied, and this is projected to decline to 3 percent by 2025, as self-supplied residents connect to regional utilities and as future growth is connected to public water supply systems. More specific information on utility service area populations and water demands, as well as the methodology used to develop these values is provided in **Amendment Appendix A**.

Table 4. Public Water Supply and Domestic Self-Supplied Demand (MGD).

County	2000 (Historical)		2025 (Average Conditions)	
	Public Water Supply	Domestic Self-Supply	Public Water Supply	Domestic Self-Supply
St. Lucie County	17.7	8.4	61.8	1.0
Martin County	18.8	6.1	40.1	1.5
Okeechobee Area	0.0	0.1	0.0	0.2
Total	36.5	14.6	101.9	2.7

Commercial and Industrial Self-Supply

Information in this section is unchanged from the 2004 UEC Plan Update.

This category includes Commercial and Industrial Self-Supply demands (**Table 5**). Commercial and industrial demands supplied by public utilities are included with Public Water Supply demands. The projection methodology for the Commercial and Industrial Self-Supply water usage category is discussed in the 2004 UEC Plan Update Appendix A.

Table 5. Commercial and Industrial Self-Supplied Demand (MGD).

County	2000	2025
St. Lucie County	0.1	0.2
Martin County	3.2	4.7
Total	3.3	4.9

Recreational Self-Supply

Information in this section and the Landscape and Golf Course subsections is unchanged from the 2004 UEC Plan Update.

Recreational demands supplied by public water supply utilities are included in the public water supply demands. Recreational Self-Supply demands include demands for landscape and golf course irrigation. Golf course irrigation is the largest water user in the Recreational Self-Supply water use category.

Landscape

Demand projections for this category include irrigated acreage permitted for landscaping and recreation in St. Lucie and Martin counties (**Table 6**), excluding golf courses. In 2000, there were 1,716 acres of irrigated landscape in St. Lucie County and 1,314 acres in Martin County in the self-supplied, greater than 100,000 GPD (0.1 MGD) category. Projection methodology is discussed in the 2004 UEC Plan Update Appendix A.

Table 6. Landscape Self-Supplied Demand (MGD).

County	2000	2025
St. Lucie County	3.2	5.0
Martin County	2.3	3.4
Total	5.5	8.4

Golf Course

In 2000, there were 22 golf courses in St. Lucie County (2,497 self-supplied irrigated acres) and 40 golf courses in Martin County (4,104 self-supplied irrigated acres). There are no golf courses in the portion of Okeechobee County within the UEC Planning Area. Golf course water demands in the UEC Planning Area are projected to increase from 7.4 MGD in 2000 to 15.6 MGD in 2025 (**Table 7**). Descriptions of the golf courses in St. Lucie and Martin counties, projection methodology, and the self-supplied calculation of irrigation requirements are provided in the 2004 UEC Plan Update Appendix A.

Table 7. Golf Course Self-Supplied Demand (MGD).

County	2000	2025
St. Lucie County	3.3	7.0
Martin County	4.1	8.6
Total	7.4	15.6

The sum of the Landscape demands (**Table 6**) and the Golf Course demands (**Table 7**) equal the total Recreational Self-Supplied demands, which are presented in **Table 8**.

Table 8. Recreational Self-Supplied Demand (MGD).

County	2000	2025
St. Lucie County	6.5	12.0
Martin County	6.4	12.0
Total	12.9	24.0

Thermoelectric Power Generation Self-Supply

The need for additional power supplies is expected to increase as the population in the UEC Planning Area and other portions of south Florida grows. The region's major power supplier, Florida Power & Light (FPL), expects much of the additional generating capacity to be installed will use fresh or brackish water sources and cooling tower technology as a heat rejection method. To date, most of the utility's generating capacity has used flow through cooling which primarily uses ocean water. Ocean water supply usage is not included in district water supply plans.

Thermoelectric power plants that use fresh water and flow through cooling, such as FPL's Martin County Power Plant—which uses the Martin County Reservoir for its cooling water—withdraw very large quantities of water for cooling purposes. The vast majority of this water is not consumed in the traditional sense because the water repeatedly passes through the plant and the cooling reservoir. There are, however,

evaporative losses (mostly related to the heated water contained in cooling ponds) that must be replaced from an external source beyond rainfall and runoff. Replacement water for the Martin County Reservoir was estimated at 9.8 MGD for 2000. Florida Power & Light completed an expansion of this plant in 2005. This expansion uses cooling towers with water coming from the Martin County Reservoir.

Florida Power & Light expects to construct two additional power generation facilities in Martin County by 2025. In addition, the City of Fort Pierce is developing a new power plant, the Treasure Coast Energy Center. As a result, power generation water usage demands are expected to increase from 9.8 MGD in 2000 to 47.6 MGD by 2025. These plants will use alternative water supplies, primarily from such sources as the Floridan Aquifer, captured excess stormwater and reuse water.

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SECTION 3

Water Supply Development Projects

Florida water law identifies two types of projects to meet water needs: Water Supply Development projects and Water Resource Development projects. Water Supply Development projects are “local” water supply projects and are the responsibility of the water user to implement. Water Resource Development projects are generally the responsibility of a water management district, and are intended to assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial and to maintain the functions of natural systems.

The Year 2025 was identified as the planning horizon for this *2006 Upper East Coast Water Supply Plan Amendment* (2006 UEC Plan Amendment) and the South Florida Water Management District’s (SFWMD or District) regional water supply plan updates. From 2000 to 2025, the population in the Upper East Coast (UEC) Planning Area is projected to increase over 80 percent, from 320,664 to 584,927. From 2000 to 2025, water withdrawal demand for all users is projected to increase by approximately 30 percent, from 290 million gallons per day (MGD) to 378 MGD.

Water to serve increased future urban demand is expected to be developed primarily from alternative water supplies, including brackish groundwater resources, surface water captured during wet weather and expanded reclaimed water systems. Agriculture is projected to remain the largest water user in the UEC Planning Area; however, agricultural water demand is forecast to decrease from 213 MGD to about 197 MGD (7 percent) between years 2000 and 2025.

This section provides a summary of the Water Supply Development projects anticipated to be constructed by water users to meet the needs of the UEC Planning Area through 2025. Information is provided for each water use category, with a particular emphasis on the fast-growing public water supply sector. Additional details about individual users, projects, quantities developed and project costs can be found in **Amendment Appendices A**, modified from the *2004 Upper East Coast Water Supply Plan Update* (2004 UEC Plan Update), **F** and **G**.

Water supply development is defined in Section 373.019(24), Florida Statutes (F.S.), as the planning, design, construction, operation and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale or end use.

Local governments, government-owned and privately owned utilities, regional water supply authorities, multijurisdictional water supply entities, self-suppliers, utilities, and other water users are primarily responsible for water supply development projects.

In 2005, significant amendments regarding regional water supply planning were made to the Florida Water Resources Act (Chapter 373, Florida Statutes). The amendments included project-specific recommendations; strengthened the linkage between local government comprehensive plans and regional water supply plans; and, established the Water Protection and Sustainability Program to provide funding assistance for construction of alternative water supply projects.

The 2005 Water Protection and Sustainability Program established a recurring state funding source to support alternative water supply development, e.g., construction of desalination, reclaimed water and seasonal storage facilities. State funds are matched with District funds and administered through the District's Alternative Water Supply Funding Program to cost-share alternative water supply projects that are ready for construction. Eligible projects can receive up to 40 percent of the construction costs for work that can be completed within the funding period (October 1 through August 1). Funding proposals are solicited in the spring of each year. Applicants must cost-share at least 60 percent of the construction cost.

In Fiscal Year 2006, the District awarded \$43.1 million in state and District grant funding to 80 alternative water supply projects Districtwide. Of the 80 projects funded, 40 were classified as reclaimed water projects; 23 were brackish water projects; and, 17 projects included storage, aquifer storage and recovery wells, and other alternative water supply projects. Of the 80 projects funded in Fiscal Year 2006, eight alternative water supply projects were located in the UEC Planning Area. They consisted of five reclaimed projects and three brackish water projects (two projects were combined into one).

Program funds are for construction of alternative water supply projects, and applicants must pay at least 60 percent of a project's construction costs. The fact that an alternative water supply project has been included in this plan amendment makes it eligible for funding consideration, but does not guarantee District funding for the project. Inclusion in this plan amendment does not serve by itself as an application for funding. Alternative water supply funding requires completion and submittal (by the project owner) of a separate application for each project for which funding is requested on an annual basis. Application for alternative water supply funding, as well as submittal time frames and requirements are available from the District's Web site at <http://www.sfwmd.gov/org/wsd/aws>. Additional information about all projects submitted for this 2006 UEC Plan Amendment can be found in **Amendment Appendix F**.

Water Supply Development projects selected for inclusion in this 2006 UEC Plan Amendment primarily include alternative water supplies. As part of the preparation process for this plan amendment, the District circulated a questionnaire to solicit information from municipal, agricultural and other water suppliers regarding the traditional and alternative water supply projects planned to meet their needs for the next 20 years. This process enabled local governments, water suppliers and water users to provide input on the proposed water supply projects in this plan amendment.

Several criteria, such as resource constraints and whether the project actually contributes new supply, were evaluated to determine whether to include projects in this plan amendment. Not all projects submitted in response to the questionnaires are included in this plan amendment. Several of the projects submitted for consideration reflect general maintenance practices, such as maintenance of existing facilities and improvements in the distribution system. While these projects represent good utility practice, they do not represent alternative water supply projects.

Additionally, a project identified for inclusion in this plan amendment may not be selected for development by the utility. In accordance with Section 373.0361(6), Florida Statutes (F.S.), nothing contained in the water supply component of a regional water supply plan should be construed to require local governments, public or privately owned utilities, special districts, self-suppliers, multijurisdictional entities and other water suppliers to select that identified project. If the projects identified in this plan amendment are not selected by a utility, the utility will need to identify another method to meet its needs, advise the District of the alternate project(s) and a local government will need to include such information in its 10-Year Water Supply Facilities Work Plan.

Demand and supply conditions for the six water use categories—Public Water Supply, Domestic Self-Supply, Thermoelectric Power Generation Self-Supply, Recreational Self-Supply, Commercial and Industrial Self-Supply, and Agricultural Water Use—are contained in the 2004 UEC Plan Update. For the purposes of this plan amendment, only Public Water Supply and Thermoelectric Power Generation were updated. A summary of the other water use categories is provided in the 2004 UEC Plan Update. Because the majority of growth in demand during the next 20 years will occur in the urban sector, and more specifically within the public water systems, particular emphasis is placed on evaluating future needs and supply projects in those categories.

PUBLIC WATER SUPPLY

Public Water Supply includes all potable uses served by municipal and private utilities. Public Water Supply demand is projected to grow from 37 MGD (in 2000) to 102 MGD by 2025. Public water demand is currently met through a combination of traditional groundwater supplies and brackish groundwater.

As prescribed by Section 373.0361(2), F.S., water supply options, including traditional and alternative water supplies, were evaluated to meet the future urban needs of this region. Traditional sources in the UEC Planning Area include the Surficial Aquifer System (SAS) and fresh water from surface sources. Alternative water supplies or nontraditional sources include seawater or brackish water, surface water captured during wet-weather flows, new



Reverse Osmosis Trains

storage capacity, reclaimed water, storm water for consumptive uses, and any other nontraditional source used by the planning region. These options may make additional water available from historically used sources by providing improved management of the resource, or there may be a new source of water specific to that service area. New storage capacity makes water available during times of the year when water would typically not be available. **Table 1** presents the SFWMD’s classification of water source options.

Table 1. The SFWMD Classification of Water Source Options.

Traditional	Fresh Groundwater	
	Fresh Surface Water	
Alternative	Brackish Water	Groundwater
		Surface Water
	Captured Stormwater / Surface Water	Underground (i.e., Aquifer Storage & Recovery)
		Aboveground (i.e., Reservoir)
	Reclaimed Water	Domestic Wastewater Treatment Facility Used for Beneficial Purposes
		Seasonal Storage (i.e., Aquifer Storage & Recovery)
	Seawater	Surface Water
	Other	Nontraditional sources identified in Water Supply Plans
		Conveyance facilities/operable structures for water supply
Conservation		

Table 2 shows the comparison between projected public water supply demand and future supply for each county in the UEC Planning Area for 2025. Regionwide, **Table 2** shows a surplus Year 2025 condition of about 45 MGD. Countywide information also shows a range of surplus supply conditions. Utility summaries that provide individual service area data are included later in this section. **Amendment Appendix A** provides additional details on the public water supply demand and supply conditions.

The projected supplies in **Table 2** are based on existing permitted supplies; alternative water supply potable water projects submitted and approved for the District’s 2006 alternative water supply funding; eligible potable water projects submitted by local water suppliers specifically for this 2006 UEC Plan Amendment; and, District-recommended projects for those entities that did not supply project information and showed an unmet future need.

Table 2. Public Water Supply Demand and Supply Projections for 2025.

County	Projected PWS Demand (MGD)	Projected Supplies (MGD)^{a, c}	Projected Surplus or Deficit (MGD)
Martin ^b	36.2	42.9	6.7
Okeechobee	0.0	0.0	0.0
St. Lucie ^b	49.0	87.4	38.4
Total	85.2	130.3	45.1

- a. Projected supplies include only potable water in Public Water Supply systems. Projected supplies or finished water yields are shown for only those PWS projects that have been included in the utility summaries later in this section. Areas served by Domestic Self-Supply are shown as “zero” values.
- b. Local governments within this county have projected growth beyond that projected by the Bureau of Economic and Business Research (BEBR), but have not sought approval of the Florida Department of Community Affairs (FDCA) for an exception to the use of BEBR projections. Such exception data will be considered by the District when available.
- c. The total constructed capacity of reclaimed water made available for 2025 for this region is 83.1 MGD.

Traditional public water supplies in the UEC Planning Area have included fresh groundwater from the SAS and fresh surface water. Approximately 78 percent of the region’s current demand is met using the SAS. Existing demand and environmental constraints will continue to limit development of new traditional supplies sufficient to meet the increasing water demand in the planning area. Although some new traditional water supply development may be practicable given appropriate local conditions, reductions in historical water use and opportunities for addressing adverse impacts, the availability and permissibility of new traditional supplies to meet projected demands through 2025 have not been demonstrated.

Forty-seven alternative water supply projects and one traditional water supply project were submitted by local utilities and evaluated for this 2006 UEC Plan Amendment. The traditional project would yield a potential 0.5 MGD. Additionally, the eight alternative water supply projects that received cost-share funding in Fiscal Year 2006 were evaluated. Seven of these projects are general maintenance projects and one project is recommended by the District.

The alternative sources these projects propose to use include the following:

Brackish Water: 14 projects yielding a potential 63 MGD (finished water).

Reclaimed Water: 33 projects with a total constructed capacity of 83 MGD.

Reclaimed water is a key component of Florida's regional water supply plans for both wastewater management and water resource management. **Figure 1** shows the percentage of wastewater reused in each of the SFWMD's planning areas. In the UEC Planning Region, Martin County reused 77 percent of its wastewater and St. Lucie County reused 41 percent of its wastewater.

The reuse of reclaimed water is growing in the UEC Planning Area and numerous projects have been proposed by major utilities to expand their systems during the next 20 years.

The benefits of different reuse applications vary not only in terms of the project, but in terms of location. For example, installing and mandating hook-ups to a reclaimed water irrigation system in an area using treated drinking water from a municipal utility will lower the utility's per capita consumption and allow the utility to serve more customers with the same volume of potable water.

On the other hand, supplying reclaimed water to self-supplied operations, such as golf courses or other large users, can reduce competition for limited freshwater resources, but does not directly result in a reduction in demand on the potable water system. The replacement of a self-supplied withdrawal with reclaimed water will not necessarily result in an additional freshwater allocation for the utility.

Other reuse projects, such as wetland or canal recharge, can be designed to support additional allocations by offsetting resource impacts that might preclude permitting of additional wells.

The SFWMD strongly supports reuse projects and recognizes that reuse applications have multiple benefits for the implementing utility. At the planning level, however, it is difficult to predetermine the potential offset without defining and analyzing the distribution of the reuse. Such offsets will be quantified on a case-by-case basis in the consumptive use permitting process based on the reclaimed water plans developed by the provider.

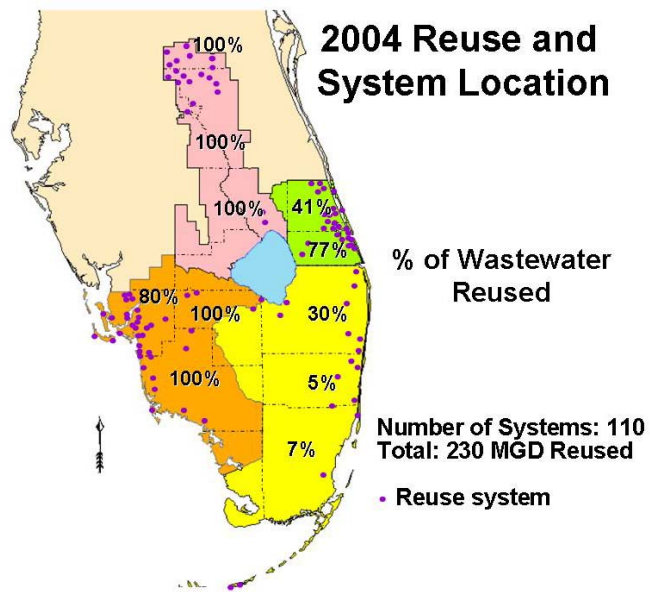


Figure 1. 2004 Reuse and System Location.

Seven water supply projects were submitted for consideration, which reflected general maintenance practices for this UEC Plan Amendment. The projects include distribution system improvements, such as potable water interconnections between local governments; acidification of wells; pump upgrades; and, backup power supplies. While these types of projects are appropriate for utility management and maintenance, they do not generate new water supply and therefore were not included in this plan amendment.

Individual summary pages that identify demand and supply projections for the major utilities in the UEC Planning Area are included on the following pages. The summaries compare yield from existing supplies and new alternative water supply projects with projected water demand for each service area for years 2015 and 2025. Reclaimed and other nonpotable alternative water supply projects are shown, but not counted toward meeting future potable demand primarily due to a lack of information on the potential reclaimed offset to potable demands and the utility-specific nature of this offset. A preliminary general assessment of whether existing and projected supplies are adequate or inadequate to meet the 2015 and 2025 projected demand for the service area is also provided.



Reclaimed Water Facility

In the UEC Planning Area, 15 of 16 utilities indicated adequate supplies to meet future demand in Year 2025 with the combination of projects they submitted and existing supplies. More than half of the utilities in the UEC Planning Area have a significant amount of alternative water supplies. One utility in the planning area identified an unmet need in future supply and did not submit projects appropriate for consideration in the plan amendment. In the case of an unmet need, the District will recommend a project or projects for local utilities to include in the plan amendment.

UTILITY SUMMARIES

Martin County

Supply Entity: Indiantown Company

Service Area: Indiantown and the Indiantown Golf and Country Club area

Population and Supply Summary:

Water supplies are comprised of 100 percent traditional groundwater and projected supplies remain the same in the future. The utility is reusing 100 percent (0.41 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	5,466	5,902	6,262
Per Capita (gallons per day finished water)		136	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.7	0.8	0.9
Volume from Traditional Sources	1.0	1.0	1.0
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.7	2.2	2.2
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			5.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	1.5	1.5	
Other	0.0	0.0	
Totals	1.5	1.5	\$5.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

Martin County

Supply Entity: Martin County Utilities (North, Tropical Farms, Port Salerno and Martin Downs)

Service Area: Jensen Beach, Martin Downs and Port Salerno areas of Unincorporated Martin County, Ocean Breeze Park and Sewall's Point

Population and Supply Summary:

Water supplies are comprised of 58 percent traditional groundwater supplies and 42 percent brackish groundwater, and are projected to be about 30 percent traditional and 70 percent alternative water supplies in the future. The utility is reusing 93 percent (2.89 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	68,820	91,258	109,752
Per Capita (gallons per day finished water)		139	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	10.5	15.4	19.4
Volume from Traditional Sources	7.5	7.5	7.5
Volume from Alternative Sources	5.5	17.8	17.8
Volume of Reclaimed Water Made Available	5.1	24.8	24.8
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional			\$0.0
Alternative ^a			59.3
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	12.3	12.3	
Seawater	0.0	0.0	
Reclaimed Water ^{a,b}	19.7	19.7	
Other	0.0	0.0	
Totals	32.0	32.0	\$59.3

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

b. Includes Highlands Reserve project.

*Martin County***Supply Entity:** Miles Grant**Service Area:** Miles Grant**Population and Supply Summary:**

Water supplies are comprised of 100 percent traditional groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.09 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	1,041	1,068	1,090
Per Capita (gallons per day finished water)		192	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.1	0.2	0.2
Volume from Traditional Sources	0.4	0.4	0.4
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.3	0.3	0.3
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a		\$0.0	
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

Martin County

Supply Entity: Piper's Landing

Service Area: Piper's Landing Yacht and Country Club

Population and Supply Summary:

Water supplies are comprised of 100 percent traditional groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.08 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	584	584	584
Per Capita (gallons per day finished water)		249	
(Note: All potable volumes are finished water unless noted.)			
	MGD	MGD	MGD
Potable Water Demand (average annual)	0.1	0.1	0.1
Volume from Traditional Sources	0.2	0.2	0.2
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.1	0.1	0.1
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

Martin County

Supply Entity: Plantation

Service Area: Indian River Plantation area on South Hutchinson Island

Population and Supply Summary:

Water supplies are comprised of 100 percent brackish groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.15 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	648	648	648
Per Capita (gallons per day finished water)		253	
(Note: All potable volumes are finished water unless noted.)			
	MGD	MGD	MGD
Potable Water Demand (average annual)	0.2	0.2	0.2
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	0.4	0.4	0.4
Volume of Reclaimed Water Made Available	0.3	0.3	0.3
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

*Martin County***Supply Entity:** Sailfish Point**Service Area:** Sailfish Point**Population and Supply Summary:**

Water supplies are comprised of 100 percent brackish groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.09 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	372	372	372
Per Capita (gallons per day finished water)		546	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.2	0.2	0.2
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	0.4	0.4	0.4
Volume of Reclaimed Water Made Available	0.3	0.3	0.3
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

Martin County**Supply Entity:** South Martin Regional Utility**Service Area:** Town of Jupiter Island, Hobe Sound and southeast Unincorporated Martin County**Population and Supply Summary:**

Water supplies are comprised of 73 percent traditional groundwater and 27 percent brackish groundwater, and are projected to be 57 percent traditional and 43 percent alternative water supplies in the future. The utility is reusing 100 percent (0.77 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	19,534	29,403	37,536
Per Capita (gallons per day finished water)		259	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	5.1	7.6	9.7
Volume from Traditional Sources	5.5	5.5	5.5
Volume from Alternative Sources	2.0	4.0	4.2
Volume of Reclaimed Water Made Available	1.2	2.7	2.7
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional ^a	0.5	0.5	\$1.5
Alternative ^b			6.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	2.0	2.2	
Seawater	0.0	0.0	
Reclaimed Water ^b	1.5	1.5	
Other	0.0	0.0	
Totals	4.0	4.2	\$7.5

a. This traditional project does not create any potable water.

b. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

Martin County**Supply Entity:** City of Stuart Utilities**Service Area:** City of Stuart**Population and Supply Summary:**

Water supplies are comprised of 100 percent traditional groundwater, and are projected to be 71 percent traditional and 29 percent alternative water supplies in the future. The utility is reusing none of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	16,504	19,782	23,631
Per Capita (gallons per day finished water)		241	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	4.0	4.8	5.5
Volume from Traditional Sources ^a	3.9	3.9	3.9
Volume from Alternative Sources	0.0	0.9	1.6
Volume of Reclaimed Water Made Available	0.0	2.7	2.7
Additional Potable Water Needed	0.1	0.0	0.0

a. This source number includes 0.9 MGD from Grumman.

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$7.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.9	1.6	
Seawater	0.0	0.0	
Reclaimed Water ^a	2.7	2.7	
Other	0.0	0.0	
Totals	3.6	4.3	\$7.0

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

ST. LUCIE COUNTY

Supply Entity: Fort Pierce Utility Authority (FPUA)

Service Area: Fort Pierce, St. Lucie Village and surrounding areas of Unincorporated St. Lucie County, including North Hutchinson Island to Indian River County line. FPUA also provides water to South Hutchinson Island to the Martin County line, and western St. Lucie County and northern St. Lucie County through bulk water agreements.

Population and Supply Summary:

Water supplies are comprised of 79 percent traditional groundwater and 21 percent brackish groundwater, and are projected to be 24 percent traditional and 76 percent alternative water supplies in the future. The utility is reusing none of its wastewater. This utility is a participant in the St. Lucie County Utility Regionalization Task Force, which is identifying opportunities to approach the water and wastewater needs of northern St. Lucie County from a regional perspective.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	76,640	107,278	133,362
Per Capita (gallons per day finished water)		148	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	11.3	15.9	19.7
Volume from Traditional Sources	11.0	11.0	11.0
Volume from Alternative Sources	3.0	29.2	35.2
Volume of Reclaimed Water Made Available	0.8	6.8	17.8
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$83.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	26.2	32.2	
Seawater	0.0	0.00	
Reclaimed Water ^a	6.0	17.0	
Other	0.0	0.0	
Totals	32.2	49.2	\$83.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

*St. Lucie County***Supply Entity:** Harbour Ridge**Service Area:** Harbour Ridge Country Club**Population and Supply Summary:**

Water supplies are comprised of 100 percent traditional groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.09 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	823	823	823
Per Capita (gallons per day finished water)		165	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.1	0.1	0.1
Volume from Traditional Sources	0.4	0.4	0.4
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.1	0.1	0.1
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

St. Lucie County

Supply Entity: Meadowood/Panther Woods Development

Service Area: Meadowood/Panther Woods Development

Population and Supply Summary:

Water supplies are comprised of 100 percent traditional groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.04 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	380	677	929
Per Capita (gallons per day finished water)		425	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.2	0.3	0.4
Volume from Traditional Sources	0.4	0.4	0.4
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.1	0.1	0.1
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

St. Lucie County

Supply Entity: Port St. Lucie Utility (Prineville and JEA formerly known as LTC Ranch)

Service Area: City of Port St. Lucie and some unincorporated areas of St. Lucie County

Population and Supply Summary:

Water supplies are comprised of 31 percent traditional groundwater supplies and 69 percent brackish groundwater, and are projected to be 15 percent traditional and 85 percent alternative water supplies in the future. The utility is reusing 13 percent (0.49 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	94,843	154,099	202,570
Per Capita (gallons per day finished water)		107	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	10.1	16.4	21.6
Volume from Traditional Sources	5.0	05.0	05.0
Volume from Alternative Sources	11.2	27.7	27.7
Volume of Reclaimed Water Made Available	3.6	22.6	29.9
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$67.3
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	16.5	16.5	
Seawater	0.0	0.0	
Reclaimed Water ^a	19.0	26.3	
Other	0.0	0.0	
Totals	35.5	42.8	\$67.3

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

St. Lucie County

Supply Entity: Reserve

Service Area: Reserve

Population and Supply Summary:

Water supplies are comprised of 100 percent traditional surface water supplies and are projected to be the same in the future. In the 2004 UEC Plan Update, this area was served by St. Lucie West Services District. It appears this area will be served by the City of Port St. Lucie Utility from 2010 forward.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	2,322	0.0	0.0
Per Capita (gallons per day finished water)		98	
(Note: All potable volumes are finished water unless noted.)			
	MGD	MGD	MGD
Potable Water Demand (average annual) ^a	0.2	0.0	0.0
Volume from Traditional Sources	0.4	0.4	0.4
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.0	0.0	0.0
Additional Potable Water Needed	0.0	0.0	0.0

- a. This utility receives approximately 0.15 MGD in annual bulk sales from St. Lucie West Services District for the Reserve original section.

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

*St. Lucie County***Supply Entity:** Spanish Lakes**Service Area:** Spanish Lakes Fairways and Country Club Village**Population and Supply Summary:**

Water supplies are comprised of 100 percent traditional groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (0.23 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	2,967	2,967	2,967
Per Capita (gallons per day finished water)		173	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.5	0.5	0.5
Volume from Traditional Sources	0.6	0.6	0.6
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.6	0.6	0.6
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.0	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

St. Lucie County

Supply Entity: St. Lucie County Utilities (North-Holiday Pines)

Service Area: Unincorporated areas of the north county mainland and service supplied through a FPUA-metered interconnect to North Hutchinson Island.

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are comprised of 100 percent traditional groundwater supplies, and are projected to be 42 percent traditional and 58 percent alternative water supplies in the future. The utility is reusing 100 percent (0.1 MGD) of its wastewater. St. Lucie County is a participant in the St. Lucie County Utility Regionalization Task Force, which is identifying opportunities to approach the water and wastewater needs of northern St. Lucie County from a regional perspective. Currently, St. Lucie County is exploring opportunities with FPUA to meet future demands. Reclaimed water and use of the FAS will play a significant role in meeting the future demands. Since no projects were submitted by St. Lucie County Utilities for this 2006 UEC Plan Amendment, the project listed below reflects a SFWMD proposed project for the county to meet future water demand. The county should contemplate a back-up plan for supply including additional conservation and AWS development in the event that local conditions do not support the following project.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	5,294	13,800	21,042
Per Capita (gallons per day finished water)		148	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	0.8	2.0	3.1
Volume from Traditional Sources ^a	1.3	1.3	1.3
Volume from Alternative Sources	0.0	0.7	1.8
Volume of Reclaimed Water Made Available	0.2	0.7	0.7
Additional Potable Water Needed	0.0	0.0	0.0

a. This utility receives approximately 1.1 MGD in annual bulk sales from Fort Pierce Utility Authority.

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			7.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water ^a	0.7	1.8	
Seawater	0.0	0.0	
Reclaimed Water ^b	0.5	0.5	
Other	0.0	0.0	
Totals	1.2	2.3	\$7.0

a. SFWMD proposed brackish water supply project total 1.1 MGD RO capacity, 1 new production well

b. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

St. Lucie County

Supply Entity: St. Lucie West Services District

Service Area: St. Lucie West and bulk sales to original section of the Reserve, both located within the City of Port St. Lucie

Population and Supply Summary:

Water supplies are comprised of 100 percent brackish groundwater and are projected to remain the same in the future. The utility is reusing 100 percent (2.35 MGD) of its wastewater.

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	7,858	14,373	19,919
Per Capita (gallons per day finished water)		181	
(Note: All potable volumes are finished water unless noted.)	MGD	MGD	MGD
Potable Water Demand (average annual)	1.4	2.6	3.6
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	3.4	3.4	3.6
Volume of Reclaimed Water Made Available	3.0	3.0	3.0
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Cumulative Capacity (MGD)		Estimated Capital Cost (\$ million)
	2015	2025	
Traditional	0.0	0.0	\$0.0
Alternative ^a			\$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.2	
Seawater	0.0	0.0	
Reclaimed Water ^a	0.0	0.0	
Other	0.0	0.0	
Totals	0.0	0.2	\$0.0

- a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

THERMOELECTRIC POWER GENERATION SELF-SUPPLY

Thermoelectric Power Generation water use in the UEC Planning Area is forecasted to grow by approximately 38 MGD between 2000 and 2025. The need for additional power supplies is expected to grow as the population in the UEC Planning Area and other portions of south Florida grows. Florida Power & Light (FPL) expects to construct two additional power generation facilities in the future for the UEC Planning Area. And, the City of Fort Pierce is developing a new power plant, the Treasure Coast Energy Center. As a result, water use demands for power generation are expected to increase from 9.8 MGD in 2000 to 47.6 MGD by 2025.

In 2005, FPL completed an expansion of the existing Martin County Plant. In addition to this plant expansion, FPL has identified a need for two additional power plants that will be located in the UEC Planning Area. As site development moves forward, site-specific projects will be identified by FPL. Considering expected water demand and the freshwater limitations in the UEC Planning Area, an alternative water supply, such as brackish water from the Floridan Aquifer, surface water captured during high-flow events, reclaimed water or a combination of these resources, is expected to provide the most feasible and primary option to meet the cooling water needs at future power generation facilities.

RECREATIONAL SELF-SUPPLY

Recreational Self-Supply projections were updated in the 2004 UEC Plan Update and are not being modified as part of this amendment. The following briefly describes this water use category, which is discussed in greater detail in the 2004 UEC Plan Update Appendix A.

The Recreational Self-Supply category includes irrigation for large landscaped areas, such as parks, golf courses and cemeteries. Information in this category and the Landscape and Golf Course subcategories is unchanged from the 2004 UEC Plan Update. The analysis for the Landscape and Golf Course subcategories concluded that landscape irrigation could not continue to rely solely on the Surficial Aquifer to meet future demands. However, it was



Golf Course – St. Lucie County

concluded from the analyses that these demands could be met with a combination of Surficial Aquifer water and reclaimed water. In the UEC Planning Area, Recreational

Self-Supply water demand is forecasted to increase from 12.8 MGD to 23.8 MGD between 2000 and 2025.

Considering the projected modest increase for growth in this category, most future supplies will come from alternative water supplies and blended supplies (brackish groundwater and fresh surface water). Reclaimed water is primarily used for irrigating large landscaped areas, such as golf courses, parks and cemeteries, as well as for residential and commercial landscaping. Projects submitted by utilities and wastewater generators for this plan amendment indicate that significant additional reclaimed water will be made available in the future.

COMMERCIAL AND INDUSTRIAL SELF-SUPPLY

Commercial and Industrial Self-Supply projections were updated in the 2004 UEC Plan Update and are not being updated as part of this plan amendment. The following briefly describes this water use category, which is discussed in greater detail in the 2004 UEC Plan Update Appendix A.

Commercial and Industrial Self-Supply water use is forecasted to grow from 3.3 MGD to 4.9 MGD between 2000 and 2025. Demand for this category of water use was projected to grow at the rate of each county's population growth. Demands for this use category for 2000 were small and remain so, as most commercial and industrial establishments in the planning area are and will continue to be served by water utilities. Considering the minimal additional projected need and the lack of specific locations or projects submitted for future Commercial and Industrial Self-Supply, traditional supplies, such as fresh groundwater, are expected to be sufficient to meet future needs in this category. Although fresh groundwater supplies are generally considered adequate to meet the relatively small new demands projected for this use category, alternative water supply development may be warranted depending on local conditions. The availability and suitability of alternative water supplies, such as reclaimed water, to meet existing and new commercial and industrial demands will be evaluated in the consumptive use permitting (CUP) process.

DOMESTIC SELF-SUPPLY

Domestic Self-Supply projections were updated in the 2004 UEC Plan Update and are not being modified as part of this plan amendment. The following briefly describes this water use category, which is discussed in greater detail in the 2004 UEC Plan Update Appendix A.

Domestic Self-Supply demands in the UEC Planning Area are forecasted to decrease from 14.6 MGD to 2.7 MGD between 2000 and 2025. Domestic Self-Supply includes potable water from a private supply, typically a domestic well, serving a private residence. Typically, property owners relying on such systems own, operate and maintain

their domestic wells. Domestic Self-Supply needs are met almost exclusively using fresh groundwater. About 29 percent of the 2000 population was self-supplied, but this is projected to decline to 3 percent by Year 2025, as more self-supplied residents connect to regional utilities and future growth is accommodated by the public water supply systems.

AGRICULTURAL WATER USE

Agricultural projections were updated in the 2004 UEC Plan Update and are not being updated as part of this plan amendment. Additional details on agricultural water use and projected demands are provided in the 2004 UEC Plan Update, Appendix A. However, the following briefly summarizes this category.

Agricultural water demand is forecasted to decrease by 7 percent to about 197 MGD by the Year 2025 for this region. Although its demand will decrease, agriculture will remain the region's largest water user in the planning area. Residential development, environmental restoration, loss of citrus acreage to past freezes, citrus canker and the North American Free Trade Agreement (NAFTA) are a few of the reasons for declines in irrigated agricultural acreage.



Citrus Industry

Traditional water sources used for irrigation include fresh surface water and/or fresh groundwater. The Floridan Aquifer System (FAS) is an important source of agricultural irrigation water, particularly in the northern portion of the planning area. The FAS, however, requires blending with surface water prior to irrigation.

Alternative water supply opportunities for agriculture include the FAS, storage and application of reclaimed water, storm water, and recapture and reuse of water normally lost to a farm's water management system (tailwater recovery). The type of irrigation system used for various agricultural operations has a significant effect on the amount of water needed to be withdrawn to meet crop demands. Although individual growers select the system, their choice is influenced by the conservation and efficiency requirements in the District's consumptive use permitting process as it applies to new installations and permit renewals. New permits for agricultural use generally require installation of low-volume irrigation systems, such as drip or under-tree spray irrigation.

Agricultural water users are not precluded from applying for, and potentially acquiring, consumptive use permits from traditional sources, as long as the conditions of permit issuance are satisfied.

Additionally, the Florida Department of Agriculture and Consumer Services (FDACS) is planning the startup of a Nursery Best Management Practices Mobile Irrigation Lab (MIL) in St. Lucie County. This lab will be primarily funded by FDACS and will be supported and cofunded by the District and the U.S. Department of Agriculture–Natural Resources Conservation Services (USDA–NRCS).

CONSERVATION

Water conservation is a critical part of the District's efforts to protect and preserve the region's water resources. Although individual water conservation projects are not included in this section, the District's Water Conservation Program and local components are discussed in the 2004 UEC Plan Update, Chapter 5. District programs include an annual funding initiative for water conservation efforts.

CONCLUSION

The UEC Planning Area's population growth over the next 20 years will significantly impact the region's public water demands, particularly in the urban sector. Development of alternative water supplies will play a vitally important role in meeting future needs, as further development of traditional water supplies becomes increasingly limited. Moreover, alternative water supply projects are designed to ensure that adequate potable water facilities are constructed and available concurrently with new development.

The largest percentage of change in water demand during the next 20 years will take place in the thermoelectric power generation self-supply sector and the public water supply sector. The thermoelectric power generation sector is projected to increase 386 percent from (2000) 10 MGD to (2025) 48 MGD, and the public water supply sector is projected to increase 179 percent from (2000) 37 MGD to (2025) 102 MGD.

Forty-seven alternative water supply projects and one traditional water supply project were submitted by local utilities and evaluated for this 2006 UEC Plan Amendment. Additionally, the eight alternative water supply projects that received cost-share funding in Fiscal Year 2006 were evaluated. Seven of these projects are general maintenance projects and one project is recommended by the District. Projects specific to each major public water supplier are included. As a result of this process, proposed new public water supply project capacity exceeds Year 2025 projected demand by 45 MGD. Meeting the projected increase of 65 MGD in the public water supply sector in the UEC Planning Area during the next 20 years will require continued emphasis on alternative water supply development, including development of brackish groundwater resources, reclaimed water and seasonally available surface water. **Appendix F** lists the water supply development projects.

Thermoelectric power generation water supply demands are projected to increase by 38 MGD with the development of three new power generation facilities in this region.

Two new FPL power plants and one power plant planned by the City of Fort Pierce are proposed to be located in this region. Investigation of water resource availability should factor heavily into site-specific selection for these new facilities. Meeting these water usage needs will require use and/or development of alternative water supplies. The amended **Appendix A** provides additional information on thermoelectric power generation.

Within 18 months following the approval of this water supply plan amendment, local governments within the UEC Planning Area are required to revise their comprehensive plans and adopt revisions to their 10-Year Water Supply Facilities Work Plans to include specific water supply projects. This 2006 UEC Plan Amendment contains water supply-related information useful to local governments in the preparation and amendment of their comprehensive plans. **Appendix G** identifies the information that local governments will need to prepare their 10-Year Water Supply Facilities Work Plans.

Through the Water Protection and Sustainability Program, which the District administers under the Alternative Water Supply Funding Program, cost-sharing funds specifically for the construction of alternative water supply projects are provided on an annual basis through state revenues and matching District funds. Local governments whose alternative water supply projects are included in this plan amendment are eligible for consideration. To apply for alternative water supply funding or for more information, see the SFWMD's Web site available from: <http://www.sfwmd.gov/org/wsd/aws>.